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LISTING OF CLAIMS

Please amend the claims as follows.

1. (Currently Amended) A method for searching, comprising:

~~splitting among parallel processing blocks elements of a set of values derived from a set of ratios;~~

computing in parallel ~~processing blocks a set of operations~~ values ~~derived from a set of input ratios, each value of the set computed by a respective processing block;~~

comparing in ~~the each~~ parallel ~~processing blocks operation~~ the ~~respective~~ computed value ~~against a predetermined to a test~~ value accessible by the respective ~~processing block parallel operation;~~

selecting ~~for each operation~~ one of the computed value and the ~~predetermined test~~ value ~~for a respective processing block~~ that is nearer to an optimum value; and

determining which of the selected values among the ~~processing blocks parallel operations~~ is nearest to the optimum value.

2. (Currently Amended) A method according to claim 1, wherein ~~splitting among parallel processing blocks elements of a set of values derived from a set of ratios~~ computing in the parallel operations the values further comprises ~~splitting among~~ computing in the parallel processing blocks a set of pre-computed values derived from the set of operations the values from pre-computed ratios, each pre-computed value of the set associated with a respective processing block.

3. (Currently Amended) A method according to claim 1, wherein ~~splitting among parallel processing blocks elements of a set of values derived from a set of ratios~~ computing in the parallel operations the values further comprises computing in the parallel processing

~~blocks the set of values derived from the set of operations the input ratios, each value of the set computed by a respective processing block.~~

4. (Currently Amended) A method according to claim 3, wherein computing ~~the set of values derived from the set of~~ ratios comprises **creating computing** a ratio of an element at an index of a first buffer to an element at a corresponding index of a second buffer.
5. (Currently Amended) A method according to claim 4, wherein **creating computing** the ratio comprises **creating computing** a ratio of a square of an element of a correlation vector to an element at a corresponding index of an energy vector in a codebook search.
6. (Currently Amended) A method according to claim 4, wherein comparing the computed value to the **predetermined test** value comprises comparing the computed ratio to a **predetermined previously computed** ratio.
7. (Currently Amended) A method according to claim 6, wherein comparing the computed ratio to the **predetermined test** ratio further comprises:
 - generating a first product of the numerator of the computed ratio multiplied by the denominator of the **predetermined test** ratio;
 - generating a second product of the numerator of the **predetermined test** ratio multiplied by the denominator of the computed ratio; and
 - determining whether the first product minus the second product is greater than zero.
8. (Currently Amended) A method according to claim 7, wherein selecting one of the computed value and the **predetermined test** value that is nearer to the optimum value comprises selecting the computed value if the first product minus the second product is greater than zero, otherwise selecting the **predetermined test** value.

9. (Currently Amended) A method according to claim 6, wherein comparing the computed ratio to the **predetermined test** ratio further comprises:

generating a first product of the numerator of the computed ratio multiplied by the denominator of the **predetermined test** ratio;

generating a second product of the numerator of the **predetermined test** ratio multiplied by the denominator of the computed ratio; and

determining whether the first product minus the second product is less than zero.

10. (Currently Amended) A method according to claim 9, wherein selecting one of the computed value and the **predetermined test** value that is nearer to the optimum value comprises selecting the computed value if the first product minus the second product is less than zero, otherwise selecting the **predetermined test** value.

11. (Currently Amended) A method according to claim 6, wherein comparing the **computed** ratio to the **predetermined test** value comprises comparing the **computed** ratio to an initial-value ratio for the respective **processing-block operation**.

12. (Currently Amended) A method according to claim 6, wherein comparing the **computed** ratio to the **predetermined test** value comprises comparing the **computed** ratio to a previously computed ratio determined on a previous iteration by the respective processing block to be nearer to the optimum value than a **predetermined test** value of the previous iteration.

13. (Currently Amended) A method according to claim 1, wherein selecting one of the computed value and the **predetermined test** value that is nearer to the optimum value comprises selecting the greater of the computed value and the **predetermined test** value.

14. (Currently Amended) A method according to claim 1, wherein the ~~set of values~~ comprises input ratios comprise ratios derived fr m buffer elements obtained from buffers accessible by the ~~respective processing blocks parallel perations~~, and

wherein selecting one of the computed value and the ~~predetermined test~~ value that is nearer to the optimum value comprises:

storing as the ~~predetermined test~~ value in a storage medium accessible by the ~~respective processing block operation~~ one of the computed value and the ~~predetermined test~~ value that is nearer to the optimum value; and

repeating ~~the elements of~~ computing, comparing, and selecting until all available buffer elements have been accessed.

15. (Currently Amended) A method according to claim 1, wherein determining which of the selected values among the ~~processing blocks parallel operations~~ is nearest to the optimum value comprises:

if there are two selected values, repeating ~~the elements of~~ comparing and selecting in a ~~processing block an operation~~, with the first selected value as the ~~predetermined test~~ value and the second selected value as the computed value; and

if there are more than two selected values, repeating in parallel ~~processing blocks the elements of operations~~ comparing and selecting, with the first selected value as the ~~predetermined test~~ value and the second selected value as the computed value for each respective ~~processing block operation~~.

16. (Currently Amended) An article of manufacture comprising a machine-accessible medium having content that provides instructions to cause an electronic device to:

~~computing~~ compute in parallel ~~processing blocks a set of operations~~ values derived from ~~a set of input~~ ratios, ~~each value of the set computed by a respective processing block;~~

~~comparing~~ compare in the ~~each~~ parallel ~~processing blocks~~ operation the respective computed value ~~against a predetermined to a test~~ value accessible by the respective ~~processing block parallel operation;~~

~~selecting~~ select for each operation one of the computed value and the ~~predetermined test~~ value ~~for a respective processing block~~ that is nearer to an optimum value; and

~~determining~~ determine which of the selected values among the ~~processing blocks~~ parallel operations is nearest to the optimum value.

17. (Currently Amended) An article of manufacture of claim 16, wherein the content to provide instructions to cause the electronic device to compute the ~~set of values derived from the set of input~~ ratios comprises the content to provide instructions to cause the electronic device to ~~create~~ compute a ratio of an element of a first buffer to an element at a corresponding index of a second buffer.

18. (Currently Amended) An article of manufacture according to claim 17, wherein the content to provide instructions to cause the electronic device to ~~create~~ compute the ratio comprises the content to provide instructions to cause the electronic device to ~~create~~ compute a ratio of a square of an element of a correlation vector to an element at a corresponding index of an energy vector in a codebook search.

19. (Currently Amended) An article of manufacture according to claim 17, wherein the content to provide instructions to cause the electronic device to compare the computed value to the ~~predetermined test~~ value comprises the content to provide instructions to cause the

electronic device to compare the computed ratio to a **~~predetermined~~ previously determined** ratio.

20. (Currently Amended) An article of manufacture according to claim 19, wherein the content to provide instructions to cause the electronic device to compare the computed ratio to the **~~predetermined~~ test** ratio further comprises the content to provide instructions to cause the electronic device to:

generate a first product of the numerator of the computed ratio multiplied by the denominator of the **~~predetermined~~ test** ratio;

generate a second product of the numerator of the **~~predetermined~~ test** ratio multiplied by the denominator of the computed ratio; and

compare the difference of the first product minus the second product to zero.

21. (Currently Amended) An article of manufacture according to claim 20, wherein the content to provide instructions to cause the electronic device to select one of the computed value and the **~~predetermined~~ test** value that is nearer to the optimum value comprises the content to provide instructions to cause the electronic device to:

if a maximum value is searched for, select the computed value if the first product minus the second product is greater than zero, otherwise selecting the **~~predetermined~~ test** value; and

if a minimum value is searched for, select the computed value if the first product minus the second product is less than zero, otherwise selecting the **~~predetermined~~ test** value.

22. (Currently Amended) An article of manufacture according to claim 19, wherein the content to provide instructions to cause the electronic device to compare the **computed** ratio to the **~~predetermined~~ test** value comprises the content to provide instructions to cause the

electronic device to compare the computed ratio to an initial-value ratio for the respective processing block operation.

23. (Currently Amended) An article of manufacture according to claim 19, wherein the content to provide instructions to cause the electronic device to compare the computed ratio to the predetermined test value comprises the content to provide instructions to cause the electronic device to compare the ratio to a previously computed ratio determined on a previous iteration ~~by the respective processing block in the operation~~ to be nearer to the optimum value than a predetermined test value of the previous iteration.

24. (Currently Amended) A method of searching a set of ratios, comprising:

~~— separating elements of vectors A and B into a number of different sets;~~

computing in parallel multiple processing units a first product of number from an indexed element of a vector A ~~multiplied by and~~ a first member of an initial value pair;

computing in the parallel multiple processing units a second product of number from an indexed element of a vector B ~~multiplied by and~~ a second member of the initial value pair;

setting, for each processing unit, the first member of the initial value pair to the value of the indexed element of vector B, and the second member of the initial value pair to the value of the indexed element of vector A, if the first product number is greater than the second product number for the processing unit;

~~— indexing sequential elements of vectors A and B of the different sets;~~

repeating ~~the above limitations~~ computing the first number, computing the second number, and the setting until a predetermined number of elements of vectors A and B has been searched; and

determining which pair of resulting initial values among the ~~parallel~~ multiple processing units provides a ratio of member one to member two that is nearest to an optimum value.

25. (Currently Amended) A method according to claim 24, wherein ~~separating the elements into the number of different sets~~ computing in multiple processing units comprises ~~separating the elements into~~ computing in a number of different sets processing units, the number corresponding to a number of available processing units.

26. (Currently Amended) A method according to claim 24, wherein ~~separating the elements into the number of different sets~~ computing in multiple processing units comprises ~~separating the elements into~~ computing in a number of different sets processing units, the number determined, at least in part, by a number of separate buffer elements that fit simultaneously on a data transfer bus from a memory to the processing units.

27. (Currently Amended) A method according to claim 24, wherein, for ratio maximization: computing the first ~~product~~ number comprises computing the multiplication of an element of the vector A of numerator elements by a denominator member of the initial value pair; and

computing the second ~~product~~ number comprises computing the multiplication of an element of the vector B of denominator elements by a numerator member of the initial value pair.

28. (Original) A method according to claim 27, wherein vector A comprises a correlation vector and vector B comprises an energy vector.

29. (Currently Amended) A method according to claim 24, wherein, for ratio minimization:

computing the first **product number** comprises computing the multiplication of an element of the vector **A** of denominator elements by a numerator member of the initial value pair; and

computing the second **product number** comprises computing the multiplication of an element of the vector **B** of numerator elements by a denominator member of the initial value pair.

30. (Currently Amended) A method according to claim 24, wherein determining which pair of resulting initial values among the **parallel multiple** processing units provides the ratio that is nearest to the optimum value comprises:

if there are two resulting initial value pairs, repeating the ~~elements of~~ computing and setting in a processing unit, with the values of one **resulting** initial value pair as the indexed elements and the values of the other **resulting** initial value pair as the initial value pair; and

if there are more than two resulting initial value pairs, repeating the ~~elements of~~ computing and setting in **parallel** processing units, with the values of one **resulting** initial value pair as the indexed elements and the values of another **resulting** initial value pair as the initial value pair for each respective processing **block unit**.

31. (Currently Amended) ~~[[A]]~~ **An** apparatus comprising:

~~control logic to separate elements of a vector A and a vector B into a number of different sets and set a pointer to index various elements of vectors A and B, the control logic to increment the indices in response to receiving an indication from a set of parallel processing units that the parallel processing units have completed a processing function;~~
and

~~a set of parallel plurality~~ of processing units to repeatedly ~~receive from the control logic and~~ process elements of vectors A and B until ~~a predetermined number of selected~~ elements of vectors A and B ~~has~~ have been searched, by:

computing a first ~~product of~~ number from an indexed element of vector A ~~multiplied by and~~ a first member of an initial value pair;

computing a second ~~product of~~ number from an indexed element of vector B ~~multiplied by and~~ a second member of the initial value pair;

setting, for each processing unit, the first member of the initial value pair to the value of the indexed element of vector B, and the second member of the initial value pair to the value of the indexed element of vector A, if the first ~~product~~ number is greater than the second ~~product~~ number for the processing unit; and

~~—indicating to the control logic that the iteration is complete;~~

selection logic to determine which pair of resulting initial values among the ~~parallel plurality of~~ processing units provides a ratio of member one to member two that is nearest to an optimum value.

32. (Currently Amended) An apparatus according to claim 31, further comprising a memory to store vectors A and B, communicatively coupled with ~~parallel the plurality of~~ processing units via a direct memory access (DMA) channel.

33. (Currently Amended) An apparatus according to claim 31, wherein the ~~control logic separates the elements into the number of different sets based on the number of parallel processing units comprises the set~~ plurality of processing units to repeatedly process the elements comprises a number of parallel processing units available in the apparatus.

34. (Currently Amended) An apparatus according to claim 31, wherein the ~~control logic~~ separates the elements into the number of different sets based on the number of parallel processing units comprises the set plurality of processing units to repeatedly process the elements comprises a number of processing unit based, at least in part on, a number of separate elements of the vectors that fit simultaneously on a data transfer bus from a memory to the processing units.

35. (Original) An apparatus according to claim 34, wherein the data transfer bus comprises a 64-bit bus, and the elements of vectors **A** and **B** comprise 16-bit values.

36. (Currently Amended) An apparatus according to claim 31, wherein the ~~parallel~~ processing units search for maximization ratios, and wherein the ~~parallel~~ processing units each compute the first ~~product number~~ by multiplying an element of the vector **A** of numerator elements by a denominator member of the initial value pair, and compute the second ~~product number~~ by multiplying an element of the vector **B** of denominator elements by a numerator member of the initial value pair.

37. (Currently Amended) An apparatus according to claim 31, wherein the ~~parallel~~ processing units search for minimum ratios, and wherein the ~~parallel~~ processing units each compute the first ~~product number~~ by multiplying an element of the vector **A** of denominator elements by a numerator member of the initial value pair, compute the second ~~product number~~ by multiplying an element of the vector **B** of numerator elements by a denominator member of the initial value pair.

38. (Currently Amended) A method of searching a codebook, comprising:

separating elements x_k and y_k of vectors **X** and **Y** among a number N parallel processing circuits to direct elements $(x_0$ and $y_0)$, $(x_N$ and $y_N)$, and $(x_{2N}$ and $y_{2N})$ to processing circuit 0,

elements $(x_1 \text{ and } y_1)$, $(x_{N+1} \text{ and } y_{N+1})$, and $(x_{2N+1} \text{ and } y_{2N+1})$ to processing circuit 1, and elements $(x_{N-1} \text{ and } y_{N-1})$, $(x_{2N-1} \text{ and } y_{2N-1})$, and $(x_{3N-1} \text{ and } y_{3N-1})$ to processing circuit $N-1$, where k represents the index of the elements of vectors \mathbf{X} and \mathbf{Y} ;

computing in the parallel processing circuits a product $x_{n,N}^2 \cdot y_{\text{init},N}$, where $x_{n,N}^2$ represents the square of the value of the element of vector \mathbf{X} at index n of processing circuit N , $y_{\text{init},N}$ represents an initial value for vector \mathbf{Y} of processing circuit N , and n represents the index of the specific separated elements to be received by processing circuit N ;

computing in the parallel processing circuits a product $x_{\text{init},N}^2 \cdot y_{n,N}$, where $x_{\text{init},N}^2$ represents the square of an initial value for vector \mathbf{X} of processing circuit N , $y_{n,N}$ represents the value of the element of vector \mathbf{Y} at index n of processing circuit N , and n represents the index of the specific separated elements to be received by processing circuit N ;

setting the values of the pair $(x_{\text{init},N}, y_{\text{init},N})$ to the values of $(x_{n,N}, y_{n,N})$ for each processing circuit N for which the condition $(x_{n,N}^2 \cdot y_{\text{init},N} ? x_{\text{init},N}^2 \cdot y_{n,N})$ is satisfied, where the operator $?$ denotes the greater than ($>$) operation for ratio maximization, and denotes the less than ($<$) operation for ratio minimization;

~~incrementing each index n for each processing circuit N ;~~

repeating the above limitations until ~~a predetermined index k~~ selected ones of vectors \mathbf{X} and \mathbf{Y} ~~has been reached~~ have been accessed; and

determining which of the various resulting pairs $(x_{\text{init},N}, y_{\text{init},N})$ is nearest to an optimum value.

39. (Original) A method according to claim 38, wherein separating the elements of vectors \mathbf{X} and \mathbf{Y} among N parallel processing circuits comprises separating the elements of vector \mathbf{X} and \mathbf{Y} among a number of parallel processing units which corresponds to the number of elements of the

vectors that can simultaneously be transmitted on a data transfer bus coupled with the processing circuits.

40. (Currently Amended) A method according to claim 38, wherein determining which of the various **resulting** pairs $(x_{init,N}, y_{init,N})$ is nearest to the optimum value further comprises:

if there are more than two resulting pairs of $(x_{init,N}, y_{init,N})$ to search, repeating ~~the elements of~~ computing and setting in parallel processing circuits with one **resulting** pair $(x_{init,N}, y_{init,N})$ as $(x_{init,N}, y_{init,N})$, and another **resulting** pair $(x_{init,N}, y_{init,N})$ as $(x_{n,N}, y_{n,N})$ for each processing circuit until there are two pairs of values remaining; and

if there are two remaining pairs of values, repeating the elements of comparing and selecting in a processing circuit, with the first **resulting** pair as $(x_{init,N}, y_{init,N})$ and the second **resulting** pair as $(x_{n,N}, y_{n,N})$.

41. (Currently Amended) A system comprising:

a processor having:

control logic to separate elements x_k and y_k of vectors **X** and **Y** into N sets, where set 0 includes elements $(x_0$ and $y_0)$, $(x_N$ and $y_N)$, and $(x_{2N}$ and $y_{2N})$, set 1 includes elements $(x_1$ and $y_1)$, $(x_{N+1}$ and $y_{N+1})$, and $(x_{2N+1}$ and $y_{2N+1})$, and set $N-1$ includes elements $(x_{N-1}$ and $y_{N-1})$, $(x_{2N-1}$ and $y_{2N-1})$, and $(x_{3N-1}$ and $y_{3N-1})$, each set to be processed by a corresponding separate parallel processing circuit, where k represents the index of the elements of vectors **X** and **Y**;

a processing core with parallel processing circuits to repeatedly compute products $(x_{n,N}^2 \cdot y_{init,N})$ and $(x_{init,N}^2 \cdot y_{n,N})$, where $x_{n,N}^2$ represents the square of the value of the element of vector **X** at index n of processing circuit N and $x_{init,N}^2$ represents the square of an initial value for vector **X** of processing circuit N , $y_{init,N}$ represents an initial value for

vector Y of processing circuit N and $y_{n,N}$ represents the value of the element of vector Y at index n of processing circuit N , and set the values of the pair $(x_{init,N}, y_{init,N})$ to the values of $(x_{n,N}, y_{n,N})$ for each processing circuit N for which the condition $(x_{n,N}^2 \cdot y_{init,N} \neq x_{init,N}^2 \cdot y_{n,N})$ is satisfied, until ~~a predetermined value of k has been reached~~ selected ones of the elements of vectors X and Y have been accessed; and

a value selection circuit to determine which of the various resulting pairs $(x_{init,N}, y_{init,N})$ is nearest to an optimum value; and

a modulator communicatively coupled with the processor to modulate signals for transmission over a communication channel.

42. (Currently Amended) A system according to claim 41, wherein the modulator is included in a front-end transmission circuit that prepares for transmission over a power line a signal including compressed speech and the selected pair $(x_{init,N}, y_{init,N})$ that is determined by the processor to be nearest to the optimum value.

43. (Original) A system according to claim 42, further comprising a channel coder coupled with the modulator to prepare the signal according to a protocol associated with a communication channel on the power line.

44. (Original) A system according to claim 41, wherein the processor is adapted to perform an algebraic codec search according to the Adaptive Multi-Rate (AMR) standard.